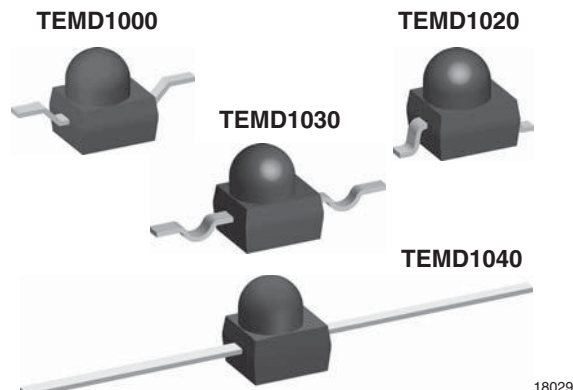


Silicon PIN Photodiode, RoHS Compliant



FEATURES

- Package type: surface mount
- Package form: GW, RGW, yoke, axial
- Dimensions (L x W x H in mm): 2.5 x 2 x 2.7
- Radiant sensitive area (in mm²): 0.23
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\phi = \pm 15^\circ$
- Package matches with IR emitter series TSMF1000
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Compliant to RoHS Directive 2002/95/EC and in accordance with WEEE 2002/96/EC


RoHS
COMPLIANT

DESCRIPTION

TEMD1000 series are PIN photodiodes with high speed and high radiant sensitivity in black, surface mount plastic packages with lens and daylight blocking filter. Filter bandwidth is matched with 870 nm to 950 nm IR emitters.

APPLICATIONS

- High speed detector for infrared radiation
- Infrared remote control and free air data transmissionsystems, e.g. in combination with TSFFxxxx series IR emitters

PRODUCT SUMMARY

| COMPONENT | I_{ra} (μA) | ϕ (deg) | $\lambda_{0.5}$ (nm) |
|-----------|---------------|--------------|----------------------|
| TEMD1000 | 6.0 to 13.0 | ± 15 | 790 to 1050 |
| TEMD1020 | 6.0 to 13.0 | ± 15 | 790 to 1050 |
| TEMD1030 | 6.0 to 13.0 | ± 15 | 790 to 1050 |
| TEMD1040 | 6.0 to 13.0 | ± 15 | 790 to 1050 |

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|------------------|
| TEMD1000 | Tape and reel | MOQ: 1000 pcs, 1000 pcs/reel | Reverse gullwing |
| TEMD1020 | Tape and reel | MOQ: 1000 pcs, 1000 pcs/reel | Gullwing |
| TEMD1030 | Tape and reel | MOQ: 1000 pcs, 1000 pcs/reel | Yoke |
| TEMD1040 | Bulk | MOQ: 1000 pcs, 1000 pcs/bulk | Axial leads |

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-----------------------------|---------------------------------|-----------|---------------|------------------|
| Reverse voltage | | V_R | 60 | V |
| Power dissipation | $T_{amb} \leq 25^\circ\text{C}$ | P_V | 75 | mW |
| Junction temperature | | T_j | 100 | $^\circ\text{C}$ |
| Operating temperature range | | T_{amb} | - 40 to + 85 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | - 40 to + 100 | $^\circ\text{C}$ |
| Soldering temperature | $t \leq 5$ s | T_{sd} | < 260 | $^\circ\text{C}$ |

**BASIC CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------|--|-----------------|------|-------------|------|---------------|
| Forward voltage | $I_F = 50\text{ mA}$ | V_F | | 1 | 1.3 | V |
| Breakdown voltage | $I_R = 100\text{ }\mu\text{A}$, $E = 0$ | $V_{(BR)}$ | 60 | | | V |
| Reverse dark current | $V_R = 10\text{ V}$, $E = 0$ | I_{ro} | | 1 | 10 | nA |
| Diode capacitance | $V_R = 5\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | | 1.8 | | pF |
| Reverse light current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | 6.0 | 10 | 13.0 | μA |
| | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | | 12 | | μA |
| Temperature coefficient of I_{ra} | $V_R = 5\text{ V}$, $\lambda = 870\text{ nm}$ | TK_{Ira} | | 0.2 | | %/K |
| Absolute spectral sensitivity | $V_R = 5\text{ V}$, $\lambda = 870\text{ nm}$ | $s(\lambda)$ | | 0.60 | | A/W |
| | $V_R = 5\text{ V}$, $\lambda = 950\text{ nm}$ | $s(\lambda)$ | | 0.55 | | A/W |
| Angle of half sensitivity | | ϕ | | ± 15 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 940 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | | 790 to 1050 | | nm |
| Rise time | $V_R = 10\text{ V}$, $R_L = 50\text{ }\Omega$, $\lambda = 820\text{ nm}$ | t_r | | 4 | | ns |
| Fall time | $V_R = 10\text{ V}$, $R_L = 50\text{ }\Omega$, $\lambda = 820\text{ nm}$ | t_f | | 4 | | ns |

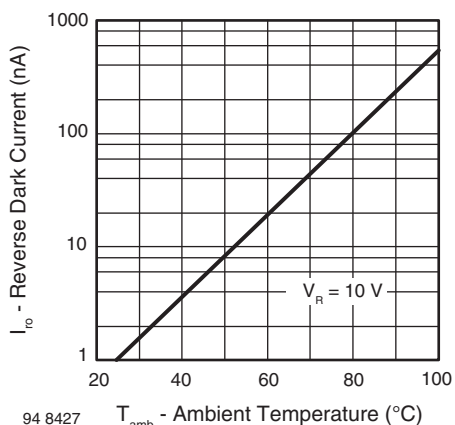
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Fig. 1 - Reverse Dark Current vs. Ambient Temperature

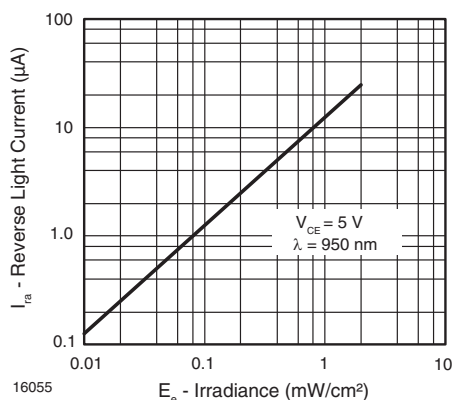


Fig. 3 - Reverse Light Current vs. Irradiance

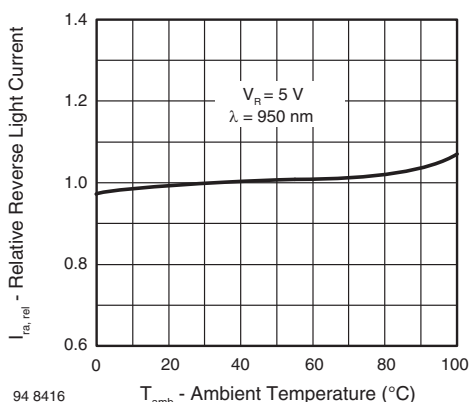


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

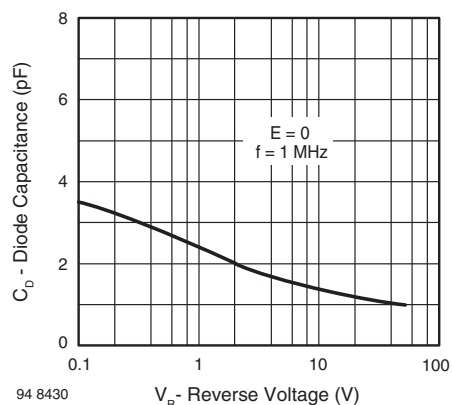


Fig. 4 - Diode Capacitance vs. Reverse Voltage

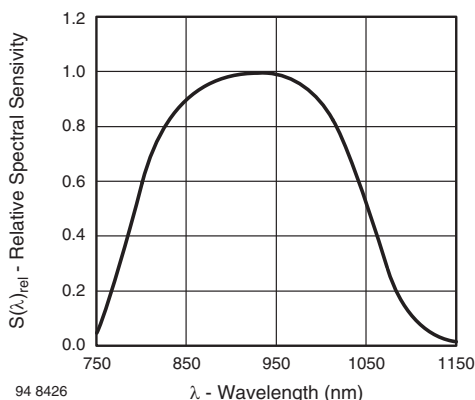


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

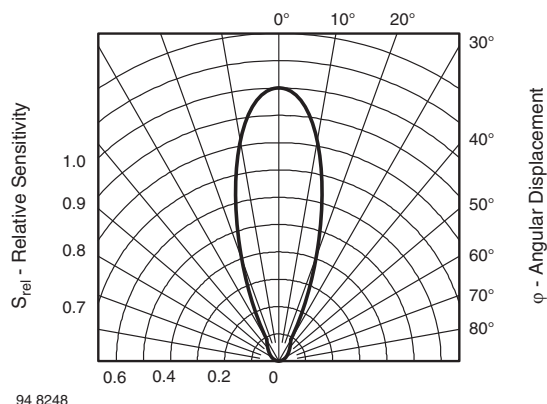


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

PRECAUTIONS FOR USE

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (burn out will happen).

2. Storage

- Storage temperature and rel. humidity conditions are: 5 °C to 35 °C, R.H. 60 %.
- Floor life must not exceed 168 h, acc. to JEDEC level 3, J-STD-020.
Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp proof box with desiccant.
Considering tape life, we suggest to use products within one year from production date.
- If opened more than one week in an atmosphere 5 °C to 35 °C, R.H. 60 %, devices should be treated at 60 °C ± 5 °C for 15 h.
- If humidity indicator in the package shows pink color (normal blue), then devices should be treated with the same conditions as 2.3.

REFLOW SOLDER PROFILE

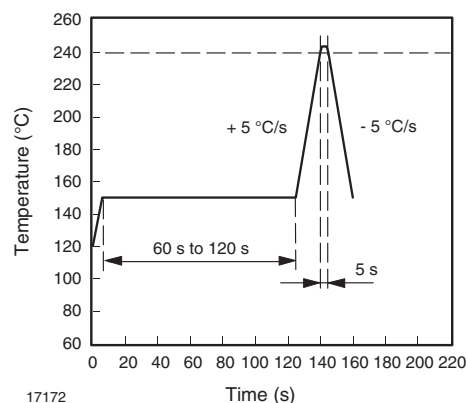


Fig. 7 - Lead Tin (SnPb) Reflow Solder Profile

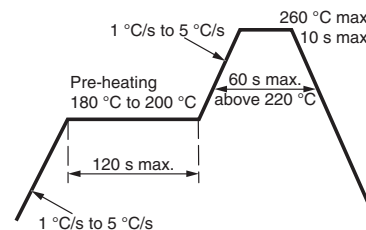
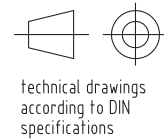
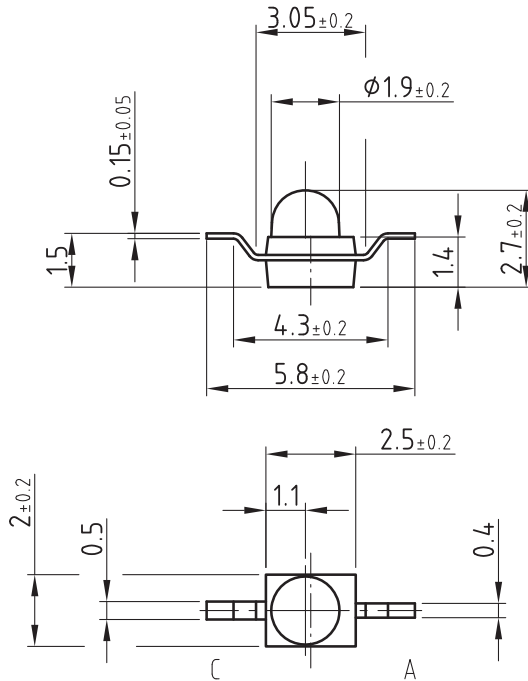


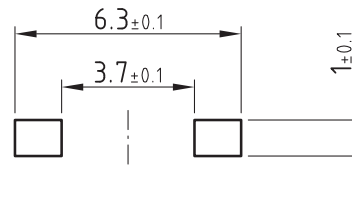
Fig. 8 - Lead (Pb)-Free Reflow Solder Profile acc. J-STD-020



PACKAGE DIMENSIONS in millimeters: TEMD1000



Solder pad proposal

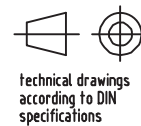
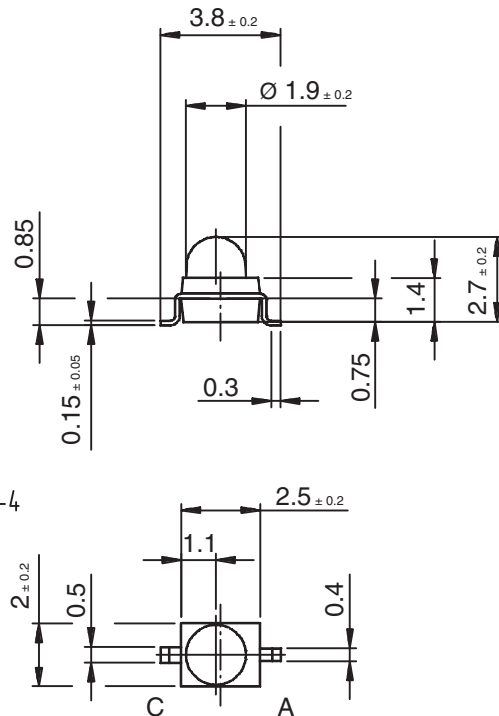


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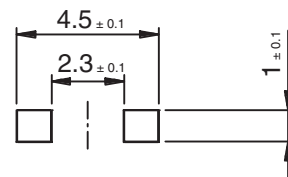
Issue: 3; 02.04.03

16159

PACKAGE DIMENSIONS in millimeters: TEMD1020



Solder pad proposal

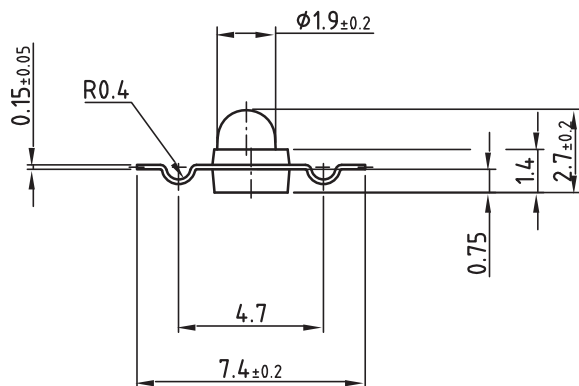


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Issue: 3; 02.04.03

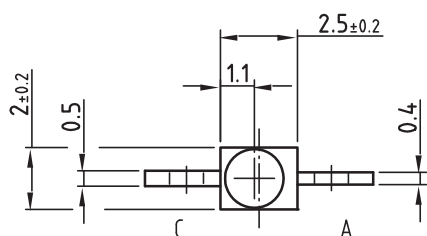
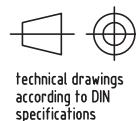
16160

PACKAGE DIMENSIONS in millimeters: TEMD1030

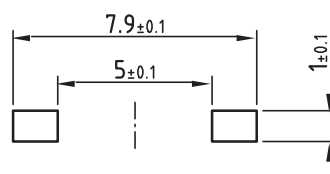


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Issue: 4; 08.05.03

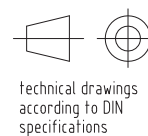
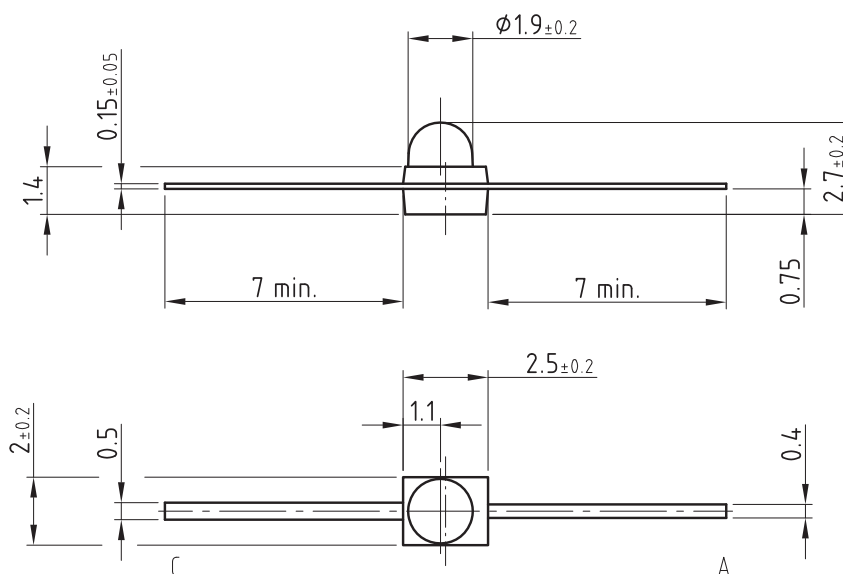


Solder pad proposal



16228

PACKAGE DIMENSIONS in millimeters: TEMD1040



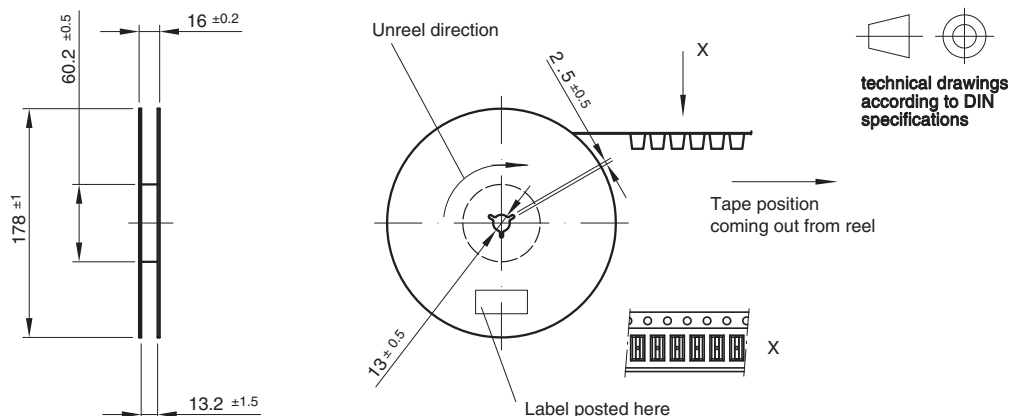
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Issue: 3; 02.04.03

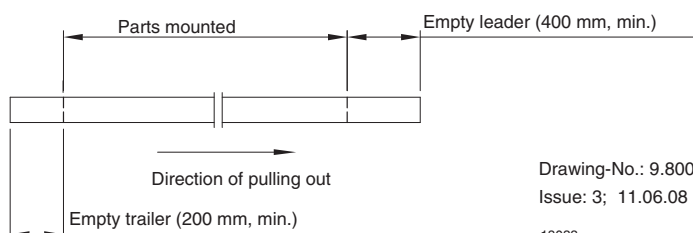
16760



REEL DIMENSIONS in millimeters



Leader and trailer tape:

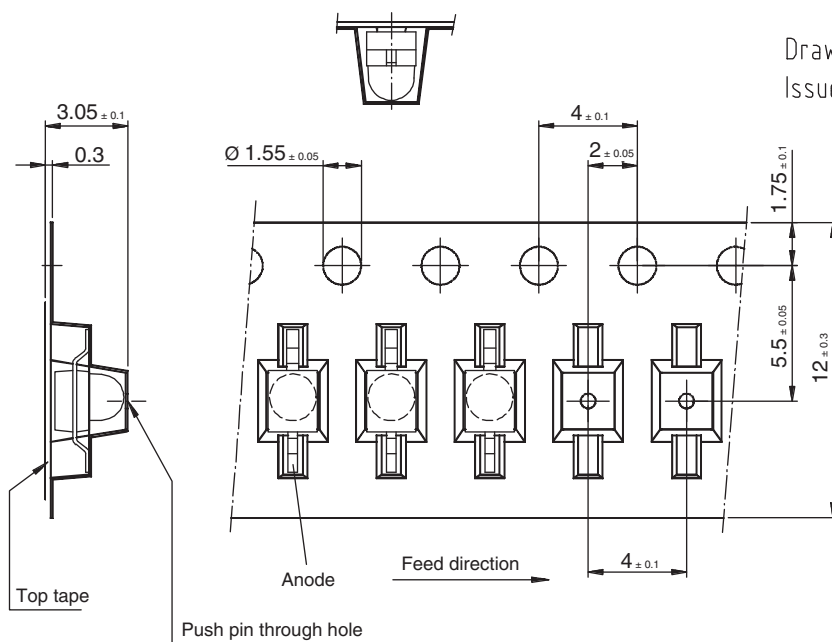


Drawing-No.: 9.800-5080.01-4

Issue: 3; 11.06.08

18033

TAPING DIMENSIONS in millimeters: TEMD1000



Drawing-No.: 9.700-5268.01-4

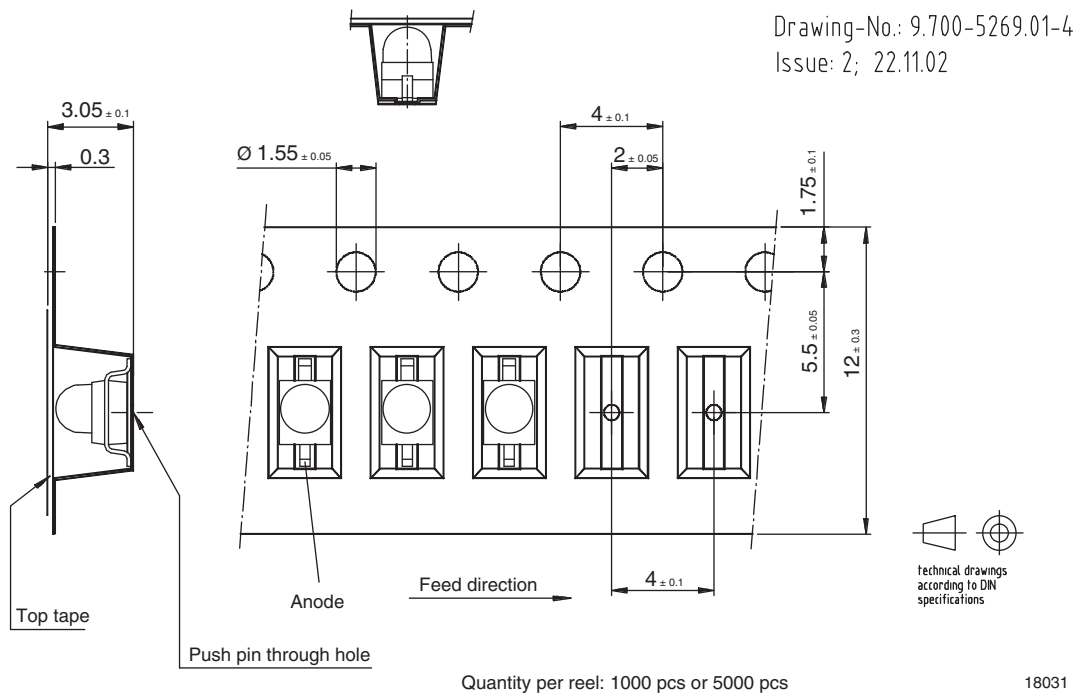
Issue: 2; 22.11.02

Quantity per reel: 1000 pcs or 5000 pcs

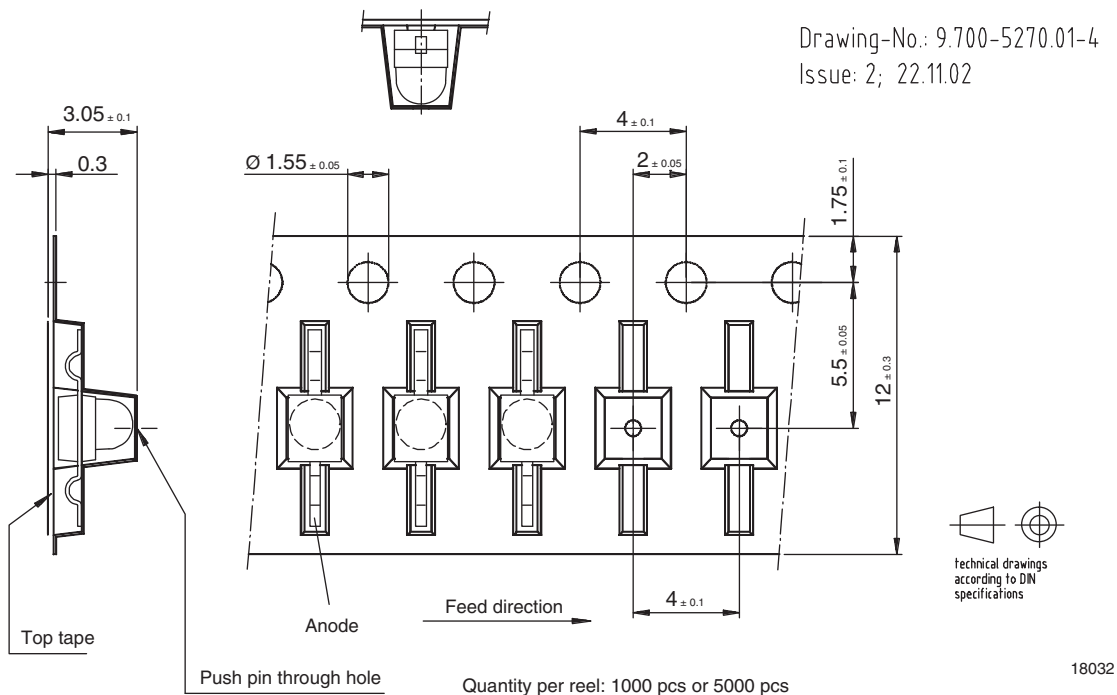
18030



TAPING DIMENSIONS in millimeters: TEMD1020



TAPING DIMENSIONS in millimeters: TEMD1030





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